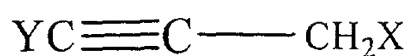


WHAT IS CLAIMED IS

1 1. A liquid synergistic preservative formulation comprising a halopropynyl compound
2 and butoxydiglycol solvent.

1 2. The preservative formulation of claim 1, wherein said halopropynyl compound is a
2 compound of formula I:



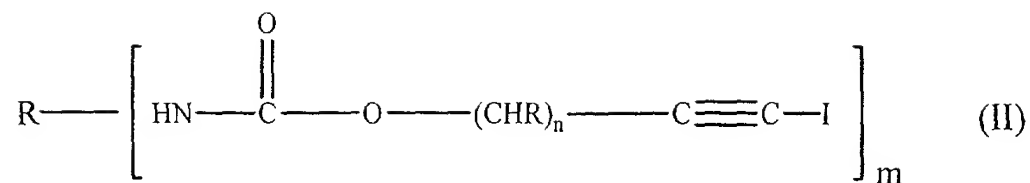
4 wherein Y is a halogen, X is selected from the group consisting of O, N, S or C, wherein said O, N,
S, or C is part of an organic functional group.

3 3. The preservative formulation of claim 1, wherein said halopropynyl compound is an
iodopropynyl compound.

4 4. The preservative formulation of claim 2, wherein X is carbon, oxygen or nitrogen and
is part of an ether, ester or carbamate group.

1 5. The preservative formulation of claim 2, wherein X is nitrogen and is part of an
2 amine, amide or a carbamate group.

1 6. The preservative formulation of claim 3, wherein said iodopropynyl compound is a
2 compound of formula II:

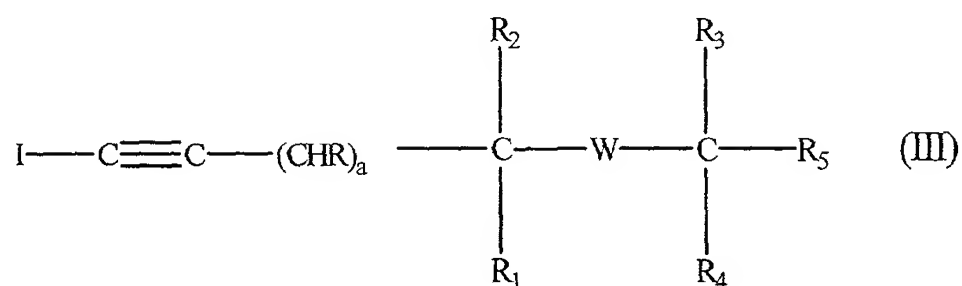


wherein:

R is selected from the group consisting of substituted and unsubstituted alkyl, aryl, and alkylaryl groups having from 1 to 20 carbon atoms; and

m and n are independently selected from 1, 2 or 3.

7. The preservative formulation of claim 3, wherein said iodopropynyl compound is a compound of formula III:



wherein:

R₁ and R₂ are defined as R₃ and R₄ below or are joined to form a cycloalkyl, cycloalkenyl, aromatic or a heterocyclic ring containing an oxygen, nitrogen or sulfur atom or an alkoxy, amino, carboxyl, halo, hydroxyl, keto or a thiocarboxyl-substituted derivative thereof;

R₃ and R₄ are independently selected from (A) hydrogen, alkyl, cycloalkyl, alkenyl, cycloalkenyl, aryl, a heterocyclic ring containing an oxygen, nitrogen or sulfur atom, alkoxy, amino,

14 carboxyl, halo, hydroxyl, keto or a thiocarboxyl and (B) substituted derivatives of the alkyl,
15 cycloalkyl, alkenyl, cycloalkenyl, aryl and the heterocyclic ring wherein the substitutions are alkyl,
16 cycloalkyl, alkenyl, cycloalkenyl, aryl, alkoxy, amino, carboxyl, halo, hydroxyl, keto or a
17 thiocarboxyl;

18 a is 0 to 16; and

19 W may be a single bond, oxygen, NR_5 , or $(\text{CR}_6\text{R}_7)_m$, wherein R_5 is hydrogen, alkyl,
20 cycloalkyl, alkenyl, cycloalkenyl, aryl or a heterocyclic ring containing an oxygen, nitrogen or sulfur
21 atom or a substituted derivative of alkyl, cycloalkyl, alkenyl, cycloalkenyl or aryl groups wherein the
22 substitutions are alkyl, cycloalkyl, alkenyl, cycloalkenyl, aryl, alkoxy, amino, carboxyl, halo,
23 hydroxyl, keto, or a thiocarboxyl wherein R_6 and R_7 are defined as R_3 and R_4 above; and

24 m is an integer from 1 to 12.

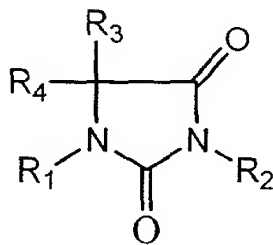
8. The preservative formulation of claim 7, wherein said compound of formula III is
iodopropynyl maleate.

1 9. A personal care product, household product or industrial product comprising an
2 antimicrobial effective amount of a preservative formulation of claim 1.

1 10. A method for killing or inhibiting the growth of microbes in a composition
2 susceptible to growth, comprising adding to said composition an antimicrobial effective amount of
3 a preservative formulation of claim 1.

1 11. The preservative formulation of claim 1, further comprising an alkanol substituted
2 dialkylhydantoin.

1 12. The preservative formulation of claim 11, wherein said alkanol substituted dialkyl
2 hydantoin is a compound of formula V:



(V)

wherein R₁ and R₂ are each independently hydrogen or (CH₂)OH, with the proviso that both R₁ and R₂ cannot be hydrogen, and R₃ and R₄ are each independently methyl, ethyl, propyl, or aryl.

13. The preservative formulation of claim 11 wherein said alkanol substituted dialkylhydantoin is dimethylol dimethylhydantoin.

1 14. A personal care product, household product or industrial product comprising an
2 antimicrobial effective amount of a preservative formulation of claim 11.

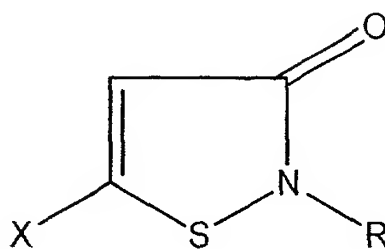
1 15. A method for killing or inhibiting the growth of microbes in a composition
2 susceptible to growth, comprising adding to said composition an antimicrobial effective amount of
3 a preservative formulation of claim 11.

1 16. A liquid preservative formulation, comprising

- 2 a) a halopropynyl compound;
- 3 b) an alkanol substituted dialkylhydantoin;
- 4 c) a hydroxyl solvent; and
- 5 d) an isothiazolone derivative.

1 17. The preservative formulation of claim 16, wherein said hydroxyl solvent is
2 butoxydiglycol.

3 18. The preservative formulation of claim 16 wherein said isothiazolone derivative is
4 a compound of formula IV:



6
7 (IV)

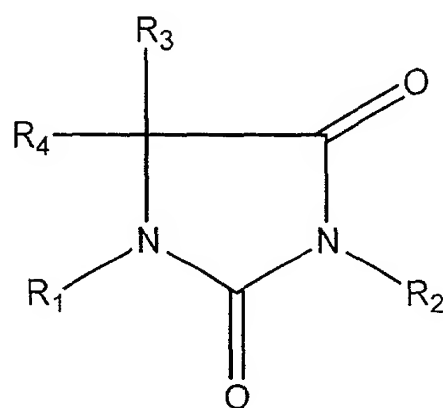
8 wherein X is hydrogen or halogen, and R is C₁₋₂₂ alkyl.

1 19. The preservative formulation of claim 16 wherein said isothiazolone derivative is
2 selected from the group consisting of 5-chloro-2-methyl-4-isothiazolin-3-one and 2-methyl-4-
3 isothiazolin-3-one.

1 20. The preservative formulation of claim 16 wherein said isothiazolone derivative is
2 selected from the group consisting of 4-chloro-2-methyl-4-isothiazolin-3-one;
3 4,5-dichloro-2-methyl-4-isothiazolin-3-one; 5-bromo-2-methyl-4-isothiazolin-3-one; 2-n-octyl-4-
4 isothiazolin-3-one; and benzisothiazolone.

1 21. The preservative formulation of claim 16, further comprising a stabilizer.

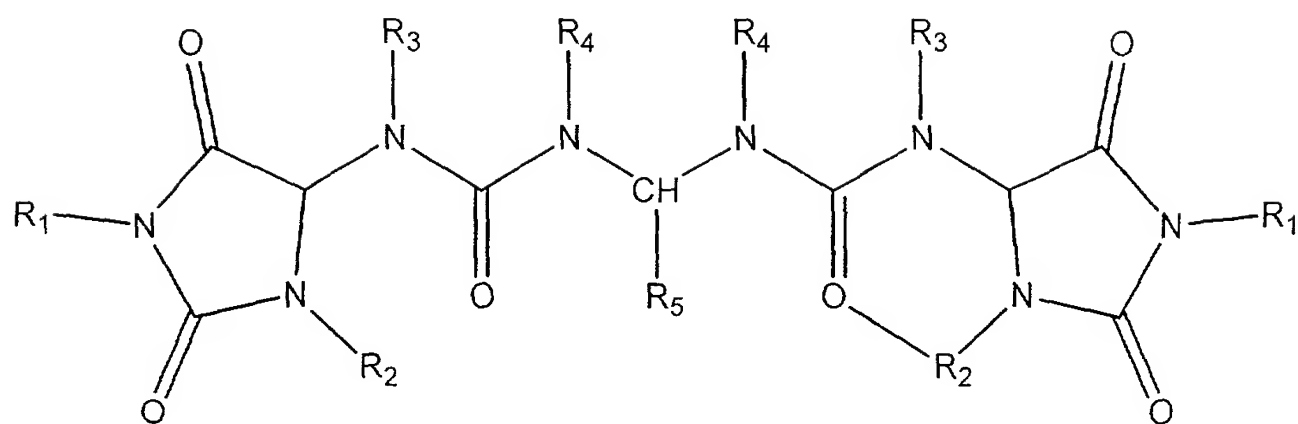
22. The preservative formulation of claim 21 wherein said stabilizer is selected from the
group consisting of (a) a compound of formula VI:



(VI)

where R_1 to R_4 are independently selected from H and a C_1 to C_{22} alkyl; or

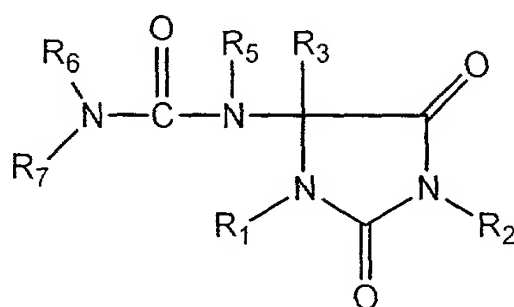
(b) a compound of formula VII:



(VII)

wherein R_1 to R_5 are independently selected from H or C_1 to C_{22} alkyl; or

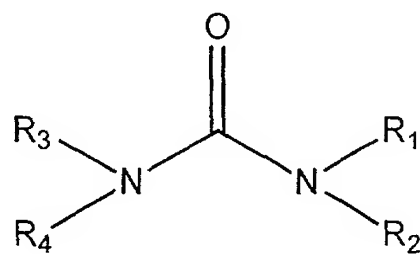
(c) a compound of formula VIII:



(VIII)

where R_1 to R_7 are independently selected from H, CH_3 , C_2H_5 or C_3H_7 ; or

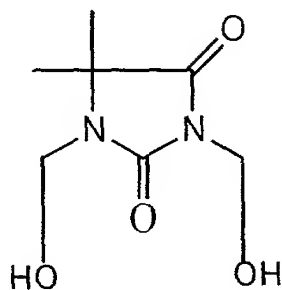
(d) a compound of formula IX:



(IX)

where R_1 to R_4 are independently selected from H or C_1 to C_{12} alkyl.

23. The preservative formulation of claim 16 wherein said alkanol substituted dialkylhydantoin is



24. The preservative formulation of claim 21, wherein said stabilizer is 5,5-dimethylhydantoin or methylethylhydantoin.

25. A personal care product, household product, or industrial product comprising an antimicrobial effective amount of a preservative formulation of claim 16.

26. A method for killing or inhibiting the growth of microbes in a composition susceptible to growth, comprising adding to said composition an antimicrobial effective amount of a preservative formulation of claim 16.

27. A method of making a liquid preservative formulation, comprising dissolving a halopropynyl compound in a butoxydiglycol, and optionally adding a water-based additive.

1 28. The method of claim 27, wherein said halopropynyl compound is an antimicrobial
2 iodopropynyl compound.

1 29. The method of claim 27, wherein said water-based additive is selected from the group
2 consisting of an isothiazolone derivative, an alkanol substituted dialkylhydantoin, and a stabilizer.

1 30. The method of claim 27, wherein said step of dissolving occurs at room temperature.